

JAPAN

EDICT OF GOVERNMENT

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JIS C 9335-2-6 (2004) (English): Household and similar electrical appliances -- Safety -- Part 2-6: Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

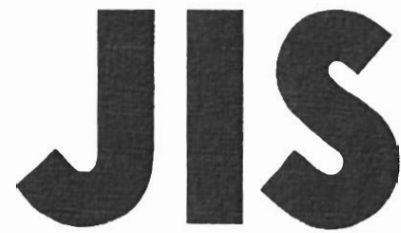
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JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
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JIS C 9335-2-6 : 2004
(JEMA)

**Household and similar electrical
appliances—Safety—
Part 2-6 : Particular requirements
for stationary cooking ranges, hobs,
ovens and similar appliances**

ICS 13.120; 97.040.20

Reference number : JIS C 9335-2-6 : 2004 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electrical Manufacturer's Association (JEMA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS C 9335-2-6 : 1998** is replaced with this Standard.

This revision has been made based on **IEC 60335-2-6 : 2002** *Household and similar electrical appliances—Safety—Part 2-6 : Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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Household and similar electrical appliances—Safety—Part 2-6 : Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances

Introduction This Japanese Industrial Standard has been prepared based on IEC 60335-2-6 *Household and similar electrical appliances—Safety—Part 2-6 : Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances* published in 2002 as the fifth edition with some modifications in the technical contents. This is to be read with conjunction with JIS C 9335-1 : 2003 *Household and similar electrical appliances—Safety—Part 1 : General requirements*.

In this Standard, the portions underlined with dots are the matters modified from the original International Standard. The list of modifications is given in annex 1 (informative) with the explanation being attached.

1 Scope This section of JIS C 9335-2 deals with the safety of stationary electric cooking ranges, hobs, ovens and similar appliances for household use, their rated voltage being not more than 250 V for single-phase appliances, and 480 V for other appliances.

NOTE 101 Examples of appliances that are within the scope of this Standard are

- griddles;
- grills;
- induction hobs;
- pyrolytic self-cleaning ovens;
- steam ovens.

As far as is practicable, this Standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTE 102 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 103 This Standard does not apply to

- appliances intended for commercial catering;

- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- grills, toasters and similar portable cooking appliances (IEC 60335-2-9);
- microwave ovens (IEC 60335-2-25).

NOTE : The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21.

IEC 60335-2-6 : 2002 *Household and similar electrical appliances—Safety—Part 2-6 : Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances* (MOD)

2 Normative references The normative references shall be as stated in clause 2 of JIS C 9335-1, except as follows.

JIS C 1602 *Thermocouples*

NOTE : IEC 60584-1 : 1995 *Thermocouples—Part 1 : Reference tables* is identical with the said standard.

3 Definitions For the purpose of this Standard clause 3 of JIS C 9335-1 is applicable except as follows.

3.1.6 Addition:

NOTE 101 For appliances having more than three heating units per phase, a diversity factor is applied to the rated current or rated power input when determining the current used to establish the size of the terminals and the nominal cross-sectional area of the supply cord. The diversity factor F is calculated from the following formula, where N is the number of heating units per phase that can be energized together:

$$F = 0.35 \pm \frac{0.65}{\sqrt{N}}$$

3.1.9 Replacement:

normal operation operation of the appliance as specified in 3.1.9.101 to 3.1.9.107

3.1.9.101 Hob elements, other than induction hob elements, are operated with vessels containing cold water. The vessel is made of unpolished commercial quality aluminium, has a flat bottom and is covered with a lid. Thermal controls are adjusted to their highest setting until the water boils and then adjusted so that the water boils gently. Water is added to maintain the level during boiling.

NOTE 1 The lid is positioned so that steam does not affect the test.

In case of doubt, vessels as specified in figure 101 are used.

Induction hob elements are operated with vessels as specified in figure 102 that contain approximately half their capacity of cooking oil at room temperature. Thermal controls are adjusted to their highest setting until the oil temperature reaches $180\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ and then adjusted so that this temperature is maintained.

For all hob elements the diameter of the bottom of the vessel is approximately equal to the diameter of the cooking zone and the quantity of liquid is specified in table 101. The vessel is positioned centrally on the cooking zone.

NOTE 2 If several cooking zones are marked for one hob element, the most unfavourable zone is used for the test.

NOTE 3 For non-circular cooking zones, the smallest non-circular vessel is used which will cover the cooking zone as far as possible, taking into account the hob rim and the other vessels.

Table 101 Quantity of liquid in the vessel

| Diameter of cooking zone mm | Quantity of water L |
|--------------------------------|------------------------|
| ≤ 110 | 0.6 |
| > 110 and ≤ 145 | 1 |
| > 145 and ≤ 180 | 1.5 |
| > 180 and ≤ 220 | 2 |
| > 220 and ≤ 300 | 3 |

3.1.9.102 Ovens are operated empty with the door closed. Thermal controls are adjusted so that the mean temperature in the centre of the oven is maintained at

- $220\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ for ovens with forced air circulation;
- $240\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ for other ovens.

NOTE: If the temperature cannot be attained, the thermal control is adjusted to its highest setting.

Ovens without thermal controls are switched on and off so that the temperature in the centre of the oven is maintained at $240\text{ }^{\circ}\text{C} \pm 15\text{ }^{\circ}\text{C}$.

Steam ovens are operated in accordance with the instructions. Controls are adjusted to their highest setting until the cooking temperature is reached and then adjusted to the lowest setting that maintains this temperature.

Steam generators intended to be filled by hand are filled according to the instructions, water being added to maintain the steam generation.

Steam generators intended to be filled automatically are connected to a water supply, the pressure of which is set according to the instructions.

The supply water has a temperature of

- $15\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for appliances to be connected to a cold water supply;
- $60\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ or the temperature indicated in the instructions, whichever is the higher, for appliances to be connected to a hot water supply.

Steam ovens are also operated while generating steam but with the thermal controls adjusted as for operation without steam.

3.1.9.103 Grills are operated empty with the grill pan and food supports in the most unfavourable position for normal use, the door and any other accessories being positioned in accordance with the instructions. In the absence of such instructions, the door and other accessories are placed in the most unfavourable position in which they may be left. Thermal controls are adjusted to their highest setting. However, if the instructions for grills incorporated in ovens specify a lower setting, this setting is used. Any reflectors intended to be placed above heating elements are in position.

3.1.9.104 Rotating spits in ovens or grills are operated with the load on the rotating spit as shown in figure 103. The appliance is operated taking into account the instructions with regard to

- the heating elements to be operated;
- the setting of the thermal control;
- the position of the door and grill pan.

In the absence of such instructions, the control is adjusted to its highest setting and the door is fully open or is placed in the most unfavourable intermediate position in which it may be left.

Any grill pan is placed in its lowest position.

3.1.9.105 Warming drawers and similar compartments are operated in the closed position with their controls adjusted to the highest setting.

3.1.9.106 Griddles are operated so that the temperature at the centre of the heated surface is maintained at $275\text{ }^{\circ}\text{C} \pm 15\text{ }^{\circ}\text{C}$ by adjusting their thermal controls or by switching the supply on or off.

3.1.9.107 Cooking ranges are operated with their individual heating units being operated under their stated conditions of normal operation.

3.101 oven appliance having a heated cavity with a door and constructed so that food, which may be in a container, can be placed on a shelf

3.102 grill heating unit constructed so that the food is supported on a grid or spit and is cooked by radiant heat

NOTE : The cooking operation in a grill is known as grilling or broiling.

3.103 hob appliance that incorporates a hob surface and one or more hob elements, and is built in or part of a cooking range

3.104 cooking range appliance incorporating a hob and an oven and which may incorporate a grill or griddle

3.105 pyrolytic self-cleaning oven oven in which cooking deposits are removed by heating the oven to a temperature exceeding 350 °C

3.106 steam oven oven intended for cooking food by steam generated at atmospheric pressure in the appliance

3.107 griddle heating unit having a surface on which the food is placed directly for cooking

3.108 induction hob hob containing at least one induction hob element

3.109 heating unit any part of the appliance that fulfils an independent cooking or warming function

NOTE : Examples are hob elements, ovens, grills and warming drawers.

3.110 hob surface horizontal part of the appliance on which vessels can be placed

3.111 hob element heating unit attached to the hob surface or positioned below the cooking zone

3.112 induction hob element hob element that heats metallic vessels by means of eddy currents

NOTE : The eddy currents are induced in the bottom of the vessel by the electromagnetic field of a coil.

3.113 pan detector device incorporated in a hob element that prevents its operation unless a vessel is placed on the cooking zone

3.114 cooking zone area marked on a hob surface where the vessel is placed for heating food

NOTE : When a hob element protrudes above the hob surface, its surface is the cooking zone.

3.115 touch control control actuated by contact or proximity of a finger, with little or no movement of the contact surface

3.116 temperature-sensing probe device that is inserted into the food to measure its temperature and which is a part of an oven control

3.117 rated water pressure water pressure assigned to the appliance by the manufacturer

3.201 flat control control actuated by moving of mechanical contact resulted from pushing by a finger

If the pushing pressure is not more than 40 N, such a control is considered to be a touch control.

4 General requirement The general requirement shall be as stated in clause 4 of JIS C 9335-1.

5 General conditions for the tests General conditions for the tests shall be as stated in clause 5 of JIS C 9335-1 except as follows.

5.3 Addition to 5.3 of JIS C 9335-1:

For pyrolytic self-cleaning ovens, the tests of **22.108** to **22.111** are carried out before the tests of clause **19**.

5.4 Addition to 5.4 of JIS C 9335-1:

Appliances that also use gas are supplied with gas at the appropriate rated pressure. Vessels having a diameter of 220 mm are filled with 2 L of water, covered with a lid and placed on the hob burners. The controls are adjusted to their highest setting until the water boils. They are then adjusted so that the water simmers, water being added when necessary to maintain the level.

5.101 Class III temperature-sensing probes are only subjected to the tests of clause **19**.

6 Classification Classification shall be as stated in clause **6** of JIS C 9335-1 except as follows.

6.1 Modification of 6.1 of JIS C 9335-1:

Appliances shall be class 0I, class I, class II or class III.


7 Marking and instructions Marking and instructions shall be as stated in clause 7 of JIS C 9335-1 except as follows.

7.1 Addition to 7.1 of JIS C 9335-1:

The total rated power input or rated current of induction hob elements shall be marked.

If a cooking range incorporates a socket-outlet protected by means of fuses, other than D type fuses, it shall be marked with the rated current of the relevant fuse. When a miniature fuse-link is provided, this marking shall indicate that the fuse-link is to have a high breaking capacity.

7.6 Addition to 7.6 of JIS C 9335-1:

 [symbol 5010 of IEC 60417-1] ON/OFF (push-push)

7.10 Addition to 7.10 of JIS C 9335-1:

The off position of touch controls for hobs shall be marked by the figure 0 and the on position by the figure 1. If there is no touch control for the hob, this requirement applies to the touch controls for each hob element.

NOTE 101 If the same touch control is used for switching on and off, symbol 5010 of IEC 60417-1 may be used.

7.12 Addition to 7.12 of JIS C 9335-1:

If the hob surface is of glass-ceramic or similar material and protects live parts, the instructions shall include the substance of the following:

WARNING : If the surface is cracked, switch off the appliance to avoid the possibility of electric shock.

The instructions for cooking ranges and ovens shall include the substance of the following:

During use the appliance becomes hot. Care should be taken to avoid touching heating elements inside the oven.

If the instructions state that the oven can be used as a grill with the door open, they shall contain the substance of the following:

WARNING : Accessible parts may become hot when the grill is in use. Children should be kept away.

The instructions for pyrolytic self-cleaning ovens shall state that excess spillage must be removed before cleaning and shall specify which utensils can be left in the oven during cleaning.

If, for cleaning, the manufacturer instructs the user to set the controls to a position higher than for normal cooking purposes, the instructions shall state that under such conditions the surfaces may get hotter than usual and children should be kept away.

The instructions for ovens incorporating a fan with a guard that can be removed for cleaning shall state that the oven must be switched off before removing the guard and that, after cleaning, the guard must be replaced in accordance with the instructions.

The instructions for ovens provided with a facility to use a temperature-sensing probe shall include the substance of the following:

Only use the temperature probe recommended for this oven

The instructions for cooking ranges, hobs and ovens shall state that a steam cleaner is not to be used.

The instructions for induction hobs shall include the substance of the following:

Metallic objects such as knives, forks, spoons and lids should not be placed on the hob surface since they can get hot.

The instructions for hobs incorporating a lid shall state that any spillage should be removed from the lid before opening. They shall also state that the hob surface should be allowed to cool before closing the lid.

The instructions for hobs incorporating halogen lamps shall warn the user not to stare at the hob elements.

The instructions for hobs incorporating a pan detector shall include the substance of the following:

After use, switch off the hob element by its control and do not rely on the pan detector.

If the appliance incorporates a lamp for illumination, and does not incorporate a switch providing full disconnection under overvoltage category III conditions, the instructions shall include the substance of the following:

WARNING : Ensure that the appliance is switched off before replacing the lamp to avoid the possibility of electric shock.

7.12.1 Addition to 7.12.1 of JIS C 9335-1:

The installation instructions for cooking ranges that are placed on the floor shall state that if the range is placed on a base, measures have to be taken to prevent the appliance slipping from the base.

NOTE 101 This statement is not required if the instructions specify that the range should not be placed on a base.

The installation instructions for appliances intended to be connected to the water mains shall include the maximum rated water pressure in megapascals.

7.12.3 Addition to 7.12.3 of JIS C 9335-1:

If a cooking range does not have a supply cord, the instructions shall state the type of cord to be used, taking into account the temperature of the rear surface of the appliance.

7.12.4 Addition to 7.12.4 of JIS C 9335-1:

The instructions for built-in appliances having separate control panels shall state that the control panel is only to be connected to the heating units specified in order to avoid a possible hazard.

7.15 Addition to 7.15 of JIS C 9335-1:

When it is not practical for the marking of fixed appliances to be visible after the appliance has been installed, the relevant information shall be included in the instructions or on an additional label that can be fixed near the appliance after installation.

NOTE 101 An example of such an appliance is a built-in hob.

The marking for the rated current of the fuse protecting a socket-outlet shall be placed on or near the socket-outlet.

7.101 Steam generators intended to be filled manually shall be marked with the maximum water level, which shall be visible during filling.

Compliance is checked by inspection.

7.102 The cooking zone of hob surfaces shall be identified by appropriate marking unless it is obvious.

Compliance is checked by inspection.

8 Protection against access to live parts Protection against access to live parts shall be as stated in clause 8 of JIS C 9335-1 except as follows.

8.1.2 Addition to 8.1.2 of JIS C 9335-1:

Test probe 12 of **JIS C 0922** is applied without appreciable force to parts liable to be touched accidentally in normal use by a fork or similar pointed object. It shall not be possible to touch live parts.

8.1.3 Modification of 8.1.3 of JIS C 9335-1:

The use of test probe 41 instead of test probe B and test probe 13 is only allowed when visibly glowing heating elements are situated at the top of an oven or grilling compartment.

9 Starting of motor-operated appliances Clause 9 of **JIS C 9335-1** is not applicable.

10 Power input and current Power input and current shall be as stated in clause 10 of **JIS C 9335-1** except as follows.

10.1 Addition to 10.1 of JIS C 9335-1:

The power input of induction hob elements is measured separately and the tolerances for motor-operated appliances apply.

The contribution of a socket-outlet to the power input is considered to be 1 kW.

NOTE 101 Socket-outlets are not loaded during the test.

10.2 Addition to 10.2 of JIS C 9335-1:

The current of induction hob elements is measured separately and the tolerances for motor-operated appliances apply.

The contribution of a socket-outlet to the current is considered to be 1 kW divided by the rated voltage.

NOTE 101 Socket-outlets are not loaded during the test.

11 Heating Heating shall be as stated in clause 11 of **JIS C 9335-1** except as follows.

11.1 Addition to 11.1 of JIS C 9335-1:

For cooking ranges and ovens, compliance is also checked by the test of **11.101**.

11.2 Addition to 11.2 of JIS C 9335-1:

For appliances intended to stand on the floor, a closed rectangular box is placed as close as possible to the free side of the appliance and against the rear wall of the test corner. The box is made of dull black painted plywood 10 mm thick. It has a width of 150 mm, its top being level with the hob surface and its front flush with the front surface of the appliance.

Appliances having a lid to cover the hob surface are tested with the lid open. Lids that can be removed without the aid of a tool are removed, unless the hob element cannot operate with the lid removed.

Temperature-sensing probes are placed in the oven in any position likely to occur during normal use. They are not connected to control the oven temperature. The test for pyrolytic self-cleaning ovens is carried out with temperature-sensing probes in position, unless otherwise specified in the instructions.

Detachable parts that are intended to be used to reduce the temperature of control panels are removed.

NOTE 101 A retractable part is not considered to be a detachable part.

11.3 Addition to 11.3 of JIS C 9335-1:

The temperature of the centre of the oven and the temperature rises of the surface of the rectangular box are determined using the thermocouples specified for the walls of the test corner.

NOTE 101 If the magnetic field of an induction hob element unduly influences the results, the temperature rises can be determined using platinum resistances with twisted connecting wires or any equivalent means.

11.4 Addition to 11.4 of JIS C 9335-1:

Induction hob elements are supplied separately and operated as specified for motor-operated appliances.

Cooking ranges are operated at 1.15 rated power input under normal operation. The supply voltage is measured when the power input has stabilized. This voltage is used to supply the heating units of the cooking range during the tests.

11.6 Replacement

Combined appliances are operated as specified for heating appliances.

If the temperature rise limits are exceeded in appliances incorporating motors, transformers or electronic circuits, and the power input is lower than the rated power input, the test is repeated with the appliance supplied at 1.06 times rated voltage.

11.7 Replacement:

Appliances are operated for the duration specified in **11.7.101** to **11.7.106**.

NOTE 101 Steady conditions are considered to be established if the temperature does not rise by more than 1 K in 15 min.

11.7.101 Induction hob elements are operated for 30 min. Other hob elements are operated for 60 min.

11.7.102 Ovens are operated for 60 min. If a rotating spit is provided, it is in operation.

NOTE 1 Steam ovens are operated in each mode of operation.

NOTE 2 Lamps in ovens are not manually switched on.

If an appliance incorporated two ovens that can be energized simultaneously, they are tested together.

Pyrolytic self-cleaning ovens are also operated under the cleaning conditions specified in the instructions for the maximum time allowed by the control or until steady conditions are established, whichever is shorter. During this period, other heating units that can be energized are operated under the most unfavourable conditions in normal operation.

11.7.103 Grills are operated for 30 min. However, grills having means to reduce the power input are operated for 15 min with their controls adjusted to the highest setting and then for 15 min at a setting which reduces the average power input by approximately 50 %.

Grills provided with a rotating spit are also operated with the spit rotating for 60 min.

11.7.104 Griddles incorporating a thermal control are operated until steady conditions are established. Other griddles are operated for 30 min after the centre of the heating surface attains a temperature of 275 °C.

11.7.105 Warming drawers and similar compartments are operated for 30 min.

11.7.106 For cooking ranges, combinations of heating units that can be energized simultaneously are tested together for the durations specified in **11.7.101** to **11.7.105**, heating units that have a test duration of 30 min being operated for the last 30 minutes of the test.

NOTE : For example, the sequence of tests for a cooking range incorporating a grill in the oven and a rotating spit is as follows:

- operation of the hob and oven and, if possible, with the spit rotating, for 60 min;
- cooling down to approximately room temperature;
- operation of the hob for 60 min, the grill being operated simultaneously for the last 30 minutes;
- cooling down to approximately room temperature;
- operation of the hob and grill with the spit rotating, for 60 min.

11.7.107 If the appliance incorporates a socket-outlet, an appropriate plug complying with **JIS C 8308** is engaged. The plug is connected to a 1 kW resistive load by means of an ordinary polyvinyl chloride sheathed flexible cord (code designation 60227 **IEC 53** if the code is complying with **JIS C 3662**) having a cross-sectional area of 0.75 mm². The temperature rise of the plug and socket-outlet is determined during the last 30 min of the test.

11.8 Modification of 11.8 of JIS C 9335-1:

Instead of the temperature rises stated in table 3 of **JIS C 9335-1** “for wood”, the following applies.

Temperature rises of the floor and walls of the test corner, wooden cabinets and the rectangular box shall not exceed the following values:

- appliances intended to stand on a table 65 K
- grills 75 K
- other appliances 70 K

The temperature rise of parts of the underside of built-in hobs, accessible to a 75 mm diameter probe having a hemispherical end, shall not exceed 70 K unless the instructions specify that a board is to be installed underneath the hob.

Addition to table 3 of **JIS C 9335-1**:

The temperature rise of handles of inner glass doors, grill pans, temperature-sensing probes and rotating parts in ovens or grills is not limited.

During the additional test for pyrolytic self-cleaning ovens, the temperature rise of the surface of knobs, handles and levers shall not exceed the following values:

- metal 55 K
- porcelain or vitreous material 65 K
- moulded material, rubber or wood 80 K

The temperature rises of knobs, handles and levers associated with functions that cannot be performed during the cleaning operation are not determined.

The temperature rise limits of motors, transformers and components of electronic circuits, including parts directly influenced by them, may be exceeded when the appliance is operated at 1.15 times rated power input.

The temperature rise of the plug, measured 2 mm below the surface at the centre of the engagement face, shall not exceed 45 K.

11.101 Cooking ranges and ovens are placed as specified in **11.2**. However, appliances intended to stand on the floor are positioned with their backs against one of the walls of the test corner and away from the other wall. A rectangular box as specified in **11.2** is placed against one of the sides of the appliance. The appliance is supplied at rated voltage and operated under normal operation.

All heating units, other than grills, that can be connected to the supply mains at the same time during normal use are switched on.

Ovens are operated without accessories. The mean temperature in the centre of the oven is maintained at $200\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$.

Hob elements and griddles are operated in accordance with **11.7**.

Warming drawers and similar compartments are operated with the controls adjusted to the highest setting.

The appliance is operated for 60 min or until steady conditions are established, whichever is shorter.

Temperature rises of the front and side surfaces are measured using the probe of figure 104. The probe is applied with a force of $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured.

NOTE 1 Any measuring instrument giving the same results as the probe may be used.

Temperature rises are not measured on

- surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end, unless they are protected by a detachable guard;
- surfaces of cooking ranges that are within 25 mm below the level of the hob surface or are above the hob surface;
- small parts such as oven vents, hinges and trim where the width of the accessible surface is less than 10 mm;
- surfaces within 10 mm of the edge of the oven door.

During the test, the temperature rise of surfaces shall not exceed the values specified in table 102.

Table 102 Temperature rise limits for accessible surfaces

| Surface | Temperature rise K | |
|--|---------------------------------|-------------|
| | Front surfaces of oven doors | Other parts |
| Metal and painted metal | 45 | 60 |
| Vitreous-enamelled metal | 50 | 65 |
| Glass and ceramic | 60 | 80 |
| Plastic having a thickness exceeding 0.3 mm | 80 | 100 |
| NOTE 1 The temperature rise limit of 100 K also applies for plastic material having a metal finish of thickness less than 0.1 mm. | | |
| NOTE 2 When the thickness of the plastic coating does not exceed 0.3 mm, the temperature rise limits of the supporting material apply. | | |

NOTE 2 If the door is protected by a guard, the temperature rises specified for the front surface of oven doors apply to the guard.

However, for oven doors the temperature rise limits specified for other parts apply to

- parts protected by a detachable guard;
- those parts of the door or protective means of built-in ovens situated more than 850 mm above the floor after installation of the oven;
- ovens intended to be used on a working surface.

If the oven can be used for grilling and the instructions state that for grilling the door should be closed, the test is repeated but with the oven operating in the grilling mode with the controls set according to the instructions. The grill is operated for 30 min in accordance with 11.7.103. However, if the oven has a rotating spit, the duration of the test is 60 min, with the controls set to give the most unfavourable conditions specified in the instructions. The measurements are only carried out on surfaces for which temperature rises for the front surface of oven doors apply.

12 Void

13 Leakage current and electric strength at operating temperature Leakage current and electric strength at operating temperature shall be as stated in clause 13 of JIS C 9335-1 except as follows.

13.1 Addition to 13.1 of JIS C 9335-1:

If a grill is incorporated in the oven, either the oven or the grill is operated, whichever is more unfavourable.

For hobs, the tests are carried out with a vessel filled as specified in 3.1.9.101 placed on each cooking zone.

Induction hob elements are tested as specified for motor-operated appliances.

13.2 Modification of 13.2 of JIS C 9335-1:

After the appliance has been operated for the duration specified in 11.7, the controls are adjusted to their highest setting and the leakage current is measured within 10 s of it attaining its highest value.

For stationary class I appliances, the leakage current shall not exceed the following values:

- | | |
|--|--|
| — for appliances with heating elements that are detachable or can be switched off separately | 1 mA, or 1 mA per kW power input for each element with a limit of 10 mA, whichever is higher. If the appliance has more than three heating units, only 75 % of the measured leakage current is taken into account; |
| — for other appliances | 1 mA, or 1 mA per kW rated power input with a limit of 10 mA, whichever is higher. |

If there is earthed metal between live parts and the surface of glass-ceramic or similar material of hobs, the leakage current is measured between live parts and each vessel in turn connected to the earthed metal. If there is no earthed metal, the leakage current, measured between live parts and each of the vessels in turn, shall not exceed 0.25 mA.

13.3 Addition to 13.3 of JIS C 9335-1:

If there is earthed metal between live parts and the surface of glass-ceramic or similar material of hobs, a test voltage of 1 000 V is applied between live parts and all the vessels connected to the earthed metal. If there is no earthed metal, a test voltage of 3 000 V is applied between live parts and the vessels.

14 Transient overvoltages Transient overvoltages shall be as stated in clause 14 of JIS C 9335-1.

15 Moisture resistance Moisture resistance shall be as stated in clause 15 of JIS C 9335-1 except as follows.

15.2 Addition to 15.2 of JIS C 9335-1:

Cooking ranges and hobs are positioned so that the hob surface is horizontal. A vessel having the largest diameter shown in figure 101, which does not exceed the diameter of the cooking zone, is completely filled with water containing approximately 1 % NaCl (hereafter referred to as "saline solution") and positioned centrally over the cooking zone. A further quantity of 0.5 L of the solution is poured steadily into the vessel over a period of 15 s. The test is carried out on each cooking zone in turn, after removing any residual solution from the appliance.

For hob elements incorporating a switch or a thermal control, 0.02 L of the saline solution is poured over the hob element so that it flows over the switch or control. A vessel is then placed on the hob element to depress any movable part. If controls are mounted below the hob surface, 0.5 L of the saline solution is poured steadily over the top of the hob near the controls over a period of 15 s. If the controls are mounted in the hob surface, the saline solution is poured over them.

For hobs having ventilating openings in the hob surface, 0.2 L of the saline solution is poured steadily through a funnel onto the ventilating openings. The funnel has an outlet diameter of 8 mm and is positioned vertically with the outlet 200 mm above the hob surface. The funnel is positioned above the ventilating openings so that the solution enters the appliance in the most unfavourable way.

NOTE 101 If the opening is protected, the funnel is positioned so that the solution falls onto the hob surface as close as possible to the opening.

NOTE 102 Care is to be taken to ensure that the saline solution is not poured over controls located close to ventilating openings.

For ovens and grills, 0.5 L of the saline solution is poured over the floor of the oven or grilling compartment.

For appliances having a drip tray or similar receptacle, the receptacle is filled with the saline solution. A further quantity of the solution, equal to 0.01 L per 100 cm² of the area of the top surface of the receptacle, is poured onto the receptacle through openings in the hob surface. However, the total quantity of solution shall not exceed 3 L.

For hobs having a lid, 0.5 L of the saline solution is poured uniformly over the closed lid. When the solution has run off, the surface is dried and a further 0.125 L of the solution is poured steadily from a height of approximately 50 mm onto the centre of the lid over a period of 15 s. The lid is then opened as in normal use.

Steam generators intended to be connected to the water mains are supplied at rated water pressure. Control devices for the supply of water are held open. Water is allowed to flow for 1 min after the first evidence of overflow, unless the inflow stops automatically.

NOTE 103 Only one device is held open at a time.

15.101 Temperature-sensing probes shall be constructed so that their insulation is not affected by water.

Compliance is checked by the following test.

The probe is completely immersed in water containing approximately 1 % NaCl and having a temperature of 20 °C ± 5 °C. The water is heated to the boiling point in approximately 15 min. The probe is then removed from the boiling water and immersed in water having a temperature of 20 °C ± 5 °C for 30 min.

This procedure is carried out five times after which the probe is removed from the water. All traces of liquid are then removed from the surface.

The probe shall then withstand the leakage current test of **16.2**.

NOTE : Detachable temperature-sensing probes are not connected to the appliance for this test. Non-detachable temperature-sensing probes are tested in the oven, the probe being immersed as much as possible.

16 Leakage current and electric strength Leakage current and electric strength shall be as stated in clause **16** of **JIS C 9335-1** except as follows.

16.1 Addition to **16.1** of **JIS C 9335-1**:

For hobs, the tests are carried out with a vessel filled as specified in **3.1.9.101** placed on each cooking zone.

Induction hob elements are tested as specified for motor-operated appliances.

16.2 Modification of **16.2** of **JIS C 9335-1**:

For stationary class I appliances, the leakage current shall not exceed the following values:

- | | |
|--|--|
| — for appliances with heating elements that are detachable or can be switched off separately | 1 mA, or 1 mA per kW power input for each element with a limit of 10 mA, whichever is higher. If the appliance has more than three heating units, only 75 % of the measured leakage current is taken into account; |
| — for other appliances | 1 mA, or 1 mA per kW rated power input with a maximum of 10 mA, whichever is higher. |

NOTE 101 If the oven incorporates a grill, or if the appliance incorporates a means to limit the total power input, only the leakage current of those elements that can be switched on at the same time is taken into consideration.

If there is earthed metal between live parts and the surface of glass-ceramic or similar material of hobs, the leakage current is measured between live parts and each vessel in turn connected to the earthed metal. If there is no earthed metal, the leakage current, measured between live parts and each of the vessels in turn, shall not exceed 0.25 mA.

16.3 Addition to **16.3** of **JIS C 9335-1**:

If there is earthed metal between live parts and the surface of glass-ceramic or similar material of hobs, a test voltage of 1 250 V is applied between live parts and all the vessels connected to the earthed metal. If there is no earthed metal, a test voltage of 3 000 V is applied between live parts and the vessels.

17 Overload protection of transformers and associated circuits Overload protection of transformers and associated circuits shall be as stated in clause **17** of **JIS C 9335-1**.

18 Endurance Endurance shall be as stated in clause 18 of **JIS C 9335-1**.

19 Abnormal operation Abnormal operation shall be as stated in clause 19 of **JIS C 9335-1** except as follows.

19.1 Addition to 19.1 of JIS C 9335-1:

For induction hobs, compliance is also checked by the tests of **19.101** and **19.102**, but **19.4** is not applicable.

Temperature-sensing probes are placed in the oven in any position likely to occur during normal use except that they are not connected to control the oven temperature.

19.2 Addition to 19.2 of JIS C 9335-1:

Hob elements are operated without a vessel, pan detectors being rendered inoperative. Oven doors are open or closed, whichever is more unfavourable. Hob lids are closed unless the hob elements are interlocked with the lid or an indicator lamp shows that a hob element is switched on.

NOTE 101 A lamp that is switched on and off by a thermostat or energy regulator does not show that the hob element is switched on.

For appliances incorporating more than one heating unit, the test is only carried out with the heating unit resulting in the most unfavourable conditions, its control being adjusted to the highest setting. If the appliance incorporates an oven without an indicator lamp to show that the oven is switched on, the oven is also operated, its control being adjusted to the highest setting.

NOTE 102 A lamp used for illuminating the oven, visible through the door and which is automatically switched on and off together with the oven, is considered to be an indicator lamp.

If an induction hob element has a metallic lid, a force of 30 N is applied to the closed lid in the most unfavourable place by means of test probe B of **JIS C 0922**.

Pyrolytic self-cleaning ovens are also operated under cleaning conditions, motors that operate during cleaning being switched off or disconnected in turn.

NOTE 103 Examples are motors of fans and timers.

Induction hob elements are operated under the conditions of clause 11 but with empty vessels, the controls being adjusted to the highest setting.

Steam ovens are operated without water.

Doors of separate grill compartments incorporated in a cooking range are open or closed, whichever is more unfavourable.

19.11.2 Addition to 19.11.2 of JIS C 9335-1:

During simulation of the fault conditions, it shall be possible to switch off any energized hob element.

The fault conditions are also simulated with all hob elements switched off, the appliance being supplied at rated voltage. If a pan detector is incorporated, a suitable vessel is placed on the cooking zone.

The hob elements shall not become energized.

19.13 Addition to **19.13** of **JIS C 9335-1**:

The temperature rise limit of 150 K also applies to wooden cabinets and rectangular boxes.

The temperature in the centre of pyrolytic self-cleaning ovens during the test of **19.4** shall not exceed 425 °C whenever the oven door can be opened.

The temperature rise of the windings of induction hob elements shall not exceed the values specified in **19.7**.

The electric strength test of induction hob elements is carried out immediately after switching off the appliance.

19.101 Induction hob elements are supplied at rated voltage and operated with a steel disc placed on the centre of the cooking zone. The disc has a thickness of 6 mm and the smallest diameter, rounded up to the nearest centimetre, that allows the hob element to operate.

19.102 Induction hob elements are supplied at rated voltage and operated under normal operation but with thermal controls short-circuited.

The temperature rise of the oil shall not exceed 270 K.

20 Stability and mechanical hazards Stability and mechanical hazards shall be as stated in clause **20** of **JIS C 9335-1** except as follows.

20.101 Cooking ranges and ovens shall have adequate stability when the open door is subjected to a load.

Compliance is checked by the following test.

Appliances with horizontally hinged doors are placed on a horizontal surface and a mass is placed on the centre of the open door. For non-rectangular doors, the mass is placed on the part farthest from the hinge where it could be placed in normal use.

For appliances normally placed on the floor the mass is

- 22.5 kg, for oven doors;
- 7 kg, for other doors.

For appliances normally placed on a table, the mass is 7 kg.

For appliances normally placed on the floor and having vertically hinged doors, a mass of 15 kg is placed in the most unfavourable position on the open door.

NOTE 1 The oven shelves are placed in the most unfavourable position.

NOTE 2 A sandbag may be used for the load.

NOTE 3 For an appliance having more than one door, the test is carried out on each door separately.

For cooking ranges incorporating a storage compartment adjacent to the oven and in which the shelves are pulled out simultaneously, the shelves are also loaded. The shelves are placed in the most unfavourable position and loaded with a uniformly

distributed mass. The mass in grams is equal to the area of the shelf in square centimetres multiplied by

- 7.5, if the free height above the shelf does not exceed 20 cm;
- 15, if the free height above the shelf exceeds 20 cm.

The appliance shall not tilt.

NOTE 4 Damage and deformation of doors and hinges are neglected.

21 Mechanical strength Mechanical strength shall be as stated in clause 21 of **JIS C 9335-1** except as follows.

Addition:

If the appliance has glass doors, three blows are applied to the centre of the glass, the door being in the closed position. If the door has horizontal hinges, the blows are also applied to the inside of the door when it is in the open position.

The glass shall not fracture.

If the appliance incorporates visibly glowing heating elements enclosed in glass tubes, the blows are applied to the tubes as mounted in the appliance if they are

- located at the top of the oven and accessible to test probe 41 of **JIS C 0922**;
- located elsewhere in the oven and accessible to test probe B of **JIS C 0922**.

For hob surfaces of glass-ceramic or similar material, three blows are applied to parts of the surfaces that are not exposed to impacts during the test of **21.102**, the impact energy being increased to $0.70 \text{ J} \pm 0.05 \text{ J}$. The blows are not applied to surfaces within 20 mm of knobs.

NOTE 101 If the hob surface comprises a single piece of material except for the outer frame, this test is not carried out.

NOTE 102 Additional support is not provided for the door in the open position.

After the test, temperature-sensing probes are subjected to one cycle of the procedure described in **15.101** and shall then withstand the leakage current test of **16.2**.

21.101 Oven shelves and their supports shall have adequate mechanical strength.

Compliance is checked by the following test.

A vessel filled with sand or shot is placed on the oven shelf. The total mass in kilograms is equal to 220 times the volume of the useful oven space in cubic metres, or 24 kg, whichever is less.

The shelf, with the vessel placed centrally on it, is inserted into the oven and moved as close as possible to one of the side walls. It is left in this position for 1 min and then withdrawn. It is then reinserted, moved as close as possible to the other sidewall and left for 1 min.

The test is repeated for each supporting position of the shelf. The shelf and supports shall show no distortion impairing their further use and the shelf shall not fall from the supports.

21.102 Hob surfaces of glass-ceramic or similar material shall withstand the stresses liable to occur in normal use.

Compliance is checked by the following test.

Each hob element is operated at rated power input with its control adjusted to the maximum setting. Induction hob elements are operated as specified in clause 11. When steady conditions are established, the hob element is switched off and a loaded vessel is dropped flat 10 times from a height of 150 mm onto the cooking zone.

The vessel has a flat copper or aluminium base over a diameter of $120 \text{ mm} \pm 10 \text{ mm}$, its edges being rounded with a radius of at least 10 mm. It is uniformly filled with at least 1.3 kg of sand or shot so that the total mass is $1.80 \text{ kg} \pm 0.01 \text{ kg}$.

After subjecting each cooking zone in turn to this impact, the vessel is removed and all hob elements are operated simultaneously until steady conditions are established.

A quantity of $1^{+0.1}_0 \text{ L}$ of water having a temperature of $15^\circ\text{C} \pm 5^\circ\text{C}$ and containing approximately 1 % NaCl is poured steadily over the hob surface. The appliance is then disconnected from the supply. After 15 min all excess water is removed and the appliance allowed to cool to approximately room temperature. The same quantity of the saline solution is poured over the hob surface after which excess water is removed again.

The hob surface shall not crack and the appliance shall withstand the electric strength test of **16.3**.

21.103 Temperature-sensing probes shall be constructed so that they are not damaged when trapped in the oven door.

Compliance is checked by the following test.

The probe is connected as in normal use and the sensing part or cord allowed to rest in any position likely to occur. The oven door is closed against the sensing part or cord and a force of 90 N is applied to the door in the most unfavourable place for 5 s.

The probe shall then comply with **8.1**, **15.101** and clause **29**.

NOTE : The oven is not operated during this test.

21.104 Glass panels of horizontally hinged oven doors shall withstand the thermal shock liable to occur in normal use.

Compliance is checked by the following test.

The appliance is operated as specified in clause 11. The door is then opened and 0.2 L of water having a temperature of $15^\circ\text{C} \pm 5^\circ\text{C}$ is poured within 5 s onto the centre of the glass panel.

The glass shall not fracture.

NOTE : The test is not carried out after the cleaning cycle of pyrolytic self-cleaning ovens.

22 Construction Construction shall be as stated in clause **22** of **JIS C 9335-1** except as follows.

22.21 Addition to 22.21 of JIS C 9335-1:

NOTE 101 Magnesium oxide and mineral ceramic fibres used for the electrical insulation of heating elements are not considered to be hygroscopic materials.

22.101 Hobs shall be constructed so that hob elements are prevented from rotating about a vertical axis and are adequately supported in all positions of adjustment of their supports.

NOTE : If a hob element is clamped by a nut on a central stud, an additional means is required to prevent its rotation.

Hobs with detachable hob elements shall be constructed so that damage is unlikely to occur while the hob elements are being removed or replaced.

Compliance is checked by inspection.

22.102 Timers intended to delay the operation of a heating element shall not control a radiant grill, unless the grill is thermally controlled and incorporated in an oven or other compartment.

Compliance is checked by inspection.

22.103 Oven vents shall be constructed so that any moisture or grease discharged through them cannot affect clearances and creepage distances between live parts and other parts of the appliance.

Compliance is checked by inspection.

22.104 Steam ovens shall be constructed so that steam vents and ducts are unlikely to become blocked during normal use.

Compliance is checked by inspection.

22.105 Built-in ovens shall only be vented through the front, unless provision is made for venting through a duct.

Compliance is checked by inspection.

22.106 Grills shall be constructed so that grill pans can be easily positioned without jamming.

The grill pans shall not fall from the support when moved sideways.

Compliance is checked by inspection and by manual test.

22.107 Pyrolytic self-cleaning ovens shall switch off automatically at the end of the cleaning process and require a manual operation to start another cleaning cycle.

Compliance is checked by inspection.

22.108 Pyrolytic self-cleaning ovens shall be constructed so that opening and closing of the door do not impair the interlock system or damage the door seal.

Compliance is checked by the following test.

The door is opened at least 10 cm and is then closed by applying a force of 90 N to the handle. This operation is carried out 5 000 times. Every 1 000 cycles, the interlock system for the self-cleaning function is operated.

After the test, the interlock system shall be fit for further use and the door seal shall not be damaged.

22.109 Pyrolytic self-cleaning ovens shall incorporate an interlock so that access to the oven cannot be gained when the temperature in the centre of the oven exceeds 350 °C, even if the interlock is defective.

Compliance is checked by inspection and by the following test.

The oven is supplied at rated voltage and operated under cleaning conditions, after which it is allowed to cool. While the temperature in the centre of the oven exceeds 350 °C, a force of 90 N is applied to levers and handles, and a torque of 2 Nm is applied to rotary knobs. It shall not be possible to open the door.

The test is repeated with any defect that may be expected in normal use applied to the interlock system, including interruption of the supply, only one defect being simulated at a time.

NOTE 1 Examples of defects are the breakage of a spring, or a gravity-operated part failing to drop into position.

NOTE 2 Fault conditions applied during the tests of clause 19 are not repeated.

22.110 Pyrolytic self-cleaning ovens shall be constructed so that ignitable gases cannot be discharged through vents during the cleaning process.

Compliance is checked by the following test.

A mixture of 30 g of gravy and 15 g of hydrogenated oil shortening is spread evenly over the interior of the oven, including the door. The oven is operated for 3 h at the maximum setting of the thermostat.

NOTE 1 The gravy consists of two-thirds by mass of beef extract and one-third water.

The oven is then operated under cleaning conditions and attempts are made to ignite gases that may be discharged through vents by bursts of sparks. The sparks are approximately 3 mm long, each spark having an energy of at least 0.5 J.

The sparks are applied when the temperature in the centre of the oven reaches 300 °C and at each subsequent temperature rise of 50 K.

NOTE 2 The electrodes used to produce the sparks are moved in and around the vents through which gases may be discharged.

There shall be no continuous burning of gases.

If the oven incorporates a heating element intended to eliminate smoke, the test is repeated with this heating element disconnected if the temperature in the centre of the oven exceeds 450 °C under cleaning conditions.

22.111 Pyrolytic self-cleaning ovens shall be constructed so that there is no risk of emission of flames during the cleaning process.

Compliance is checked by the following test.

A suitable vessel containing 100 g of salt-free butter is placed on the centre of the oven floor.

The electrodes of a spark generator are positioned approximately 7.5 cm above the surface of the butter.

The oven is then operated under cleaning conditions and bursts of sparks are produced. The sparks are approximately 3 mm long, each spark having an energy of at least 0.5 J. The sparks are generated when the temperature in the centre of the oven reaches 300 °C and at each subsequent temperature rise of 50 K.

There shall be no emission of flames through door seals, vents or other openings.

22.112 Hobs shall be constructed so that hinged lids cannot close accidentally.

Compliance is checked by inspection and by manual test.

NOTE : This requirement may be met if the hinge incorporates a click stop or similar means, or if the lid can be opened through an angle of at least 100°, when the appliance is placed against a wall.

22.113 Hobs shall be constructed so that inadvertent operation of touch controls is unlikely if this could give rise to a hazardous situation due to

- spillage of liquids, including that caused by a vessel boiling over;
- a damp cloth placed on the control panel.

Compliance is checked by the following test, the appliance being supplied at rated voltage. The test is carried out with each hob element energized in turn and then without energizing any hob elements.

Sufficient water to completely cover the control panel to a depth not exceeding 2 mm, with a minimum of 140 ml, is poured steadily over the control panel so that bridging occurs between combinations of touch pads.

A cloth having a mass between 140 g/m² and 170 g/m², and dimensions approximately 400 mm × 400 mm, is folded four times into a square pad, saturated with water and placed over the control panel in any position.

There shall be no operation of any hob element for longer than 10 s.

During the test, it shall be possible to switch off the energized hob element by operating the touch controls, unless it switches off automatically.

22.114 Hobs having touch controls shall require at least two manual operations to switch on a hob element but only one operation to switch it off. However, additional hob elements may be switched on by a single manual operation. In this case, 1 min after all the hob elements have been switched off, two manual operations are required to re-energize one hob element.

NOTE : Touching the contact surface at the same point twice is not considered to be two operations.

Hobs having touch controls shall incorporate visual means to indicate when each hob element is energized.

Compliance is checked by inspection and by manual test.

22.115 Induction hob elements, and other hob elements incorporating a pan detector, shall be constructed so that the hob element can only be operated when a vessel is placed on the cooking zone.

Compliance is checked by the following test, the appliance being supplied at rated voltage.

An iron bar 2 mm thick having dimensions approximately 100 mm × 20 mm is placed in the most unfavourable position on each cooking zone in turn. The controls are adjusted to their highest setting.

For induction hob elements, the temperature rise of the bar shall not exceed 35 K. Other hob elements shall not operate.

22.116 Hob elements incorporating a pan detector shall be constructed so that the hob element is not switched on by the vessel if it has been removed for more than 10 min.

Compliance is checked by manual test.

22.117 In appliances incorporating a pan detector, a signal lamp shall indicate when the control for the hob element is not switched to the off position.

Compliance is checked by inspection.

22.118 It shall not be possible to operate a grill while the plug of a supply cord is engaged in a socket-outlet located directly above the door.

Compliance is checked by inspection and by manual test.

22.119 Cooking ranges incorporating a retractable deflector to prevent excessive temperatures on control knobs shall be constructed so that the user is unlikely to touch hot surfaces of the deflector when operating the controls.

Compliance is checked by measuring the distance between the deflector in its extended position and that part of the control knob touched in normal use. It shall be at least 25 mm, or the temperature rise of those parts within 25 mm of the knob shall not exceed the limits for handles, knobs, grips and similar parts held for short periods only, as specified in table 3.

22.201 Appliance with flat controls shall have a supply switch, and the buzzer shall sound when the flat control switch is pushed or the heater becomes "ON".

Compliance is checked by inspection.

22.202 Hobs or cooking ranges shall be so constructed that it is possible to confirm that the switch surely becomes "OFF" state, when the switch is operated from "ON" to "OFF", by means of light, colour, sound, etc. and that one or more of the following requirements are satisfied:

- "ON" state shall not be realized without operation of locking mechanism (appliances which comply with 22.113 or 22.201 are excluded).
- A guard shall be provided around the switch knob.

- The operating part of switch knob shall be recessed from the surface of operating panel.

Compliance is checked by inspection.

23 Internal wiring Internal wiring shall be as stated in clause 23 of JIS C 9335-1 except as follows.

23.3 Addition to 23.3 of JIS C 9335-1:

The requirement also applies if parts of a cooking range are folded onto the hob surface, or separated from their normal position, for transportation purposes.

24 Components Components shall be as stated in clause 24 of JIS C 9335-1 except as follows.

24.1.3 Addition to 24.1.3 of JIS C 9335-1:

Switches controlling hob elements are subjected to 30 000 cycles of operation.

NOTE : This does not apply to switches having only one closed position.

24.1.4 Addition to 24.1.4 of JIS C 9335-1:

- energy regulators
 - for automatic action 100 000
 - for manual action 10 000
- self-resetting thermal cut-outs
 - for heating elements of glass-ceramic hobs 100 000
 - for heating elements of other hobs 10 000
- thermostats controlling the cleaning process in pyrolytic self-cleaning ovens 3 000

24.101 Thermostats and energy regulators incorporating an off position shall not switch on as a result of variations in ambient temperatures.

Compliance is checked by the following test that is carried out on three samples of the control.

The control, adjusted to the off position, is placed for 2 h in an ambient temperature of -20_{-5}^0 °C, and then at

- t °C, where t is the temperature according to the T-marking;
- 55 °C, for controls without a T-marking.

During the test, the off position shall be maintained.

A test voltage of 500 V is applied across the contacts for 1 min. No breakdown shall occur.

24.102 Socket-outlets incorporated in cooking ranges shall be single-phase, incorporate an earthing contact and have a rated current not exceeding 16 A. Both poles shall be protected by fuses or miniature circuit-breakers having a rated current not exceeding the rated current of the socket-outlet. They shall be placed behind a non-detachable cover. However, if the cooking range is intended to be permanently connected to fixed wiring or is fitted with a polarized plug, the neutral pole need not be protected.

Compliance is checked by inspection.

NOTE 1 The actuating member of miniature circuit-breakers may be accessible.

NOTE 2 A non-detachable cover is not required if fuses become accessible after opening a drawer or other compartment.

25 Supply connection and external flexible cords Supply connection and external flexible cords shall be as stated in clause **25** of **JIS C 9335-1** except as follows.

25.3 Addition to **25.3** of **JIS C 9335-1**:

Hobs, built-in ranges and built-in ovens may be connected to the supply mains before the appliance is installed.

25.14 Addition to **25.14** of **JIS C 9335-1**:

For temperature-sensing probes, the total number of flexings is 5 000. Probes with circular-section cords are turned through 90° after 2 500 flexings.

26 Terminals for external conductors Terminals for external conductors shall be as stated in clause **26** of **JIS C 9335-1**:

27 Provision for earthing Provision for earthing shall be as stated in clause **27** of **JIS C 9335-1**.

28 Screws and connections Screws and connections shall be as stated in clause **28** of **JIS C 9335-1**.

29 Clearances, creepage distances and solid insulation Clearances, creepage distances and solid insulation shall be as stated in clause **29** of **JIS C 9335-1** except as follows.

29.2 Addition to **29.2** of **JIS C 9335-1**:

The microenvironment is pollution degree 3 unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance.

29.3 Addition to **29.3** of **JIS C 9335-1**:

This requirement does not apply to the sheath of a visibly glowing heating element inaccessible to test probe 41 of **IEC 61032**.

30 Resistance to heat and fire Resistance to heat and fire shall be as stated in clause **30** of **JIS C 9335-1** except as follows.

30.2 Addition to **30.2** of **JIS C 9335-1**:

For grills and griddles that do not incorporate a timer, **30.2.2** is applicable. For other appliances, **30.2.3** is applicable.

31 Resistance to rusting Resistance to rusting shall be as stated in clause **31** of **JIS C 9335-1**.

32 Radiation, toxicity and similar hazards Radiation, toxicity and similar hazards shall be stated in clause **32** of **JIS C 9335-1** except as follows.

32.101 Pyrolytic self-cleaning ovens shall be constructed so that carbon monoxide is not discharged in hazardous quantities during cleaning.

Compliance is checked by the following test.

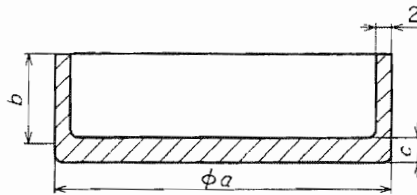
Twice the quantity of the mixture specified in **22.110** is spread evenly over the interior of the oven, including the door. The oven is supplied at rated voltage and operated for 3 h at the maximum setting of the thermostat.

The oven is then allowed to cool to room temperature and placed in a closed test room having a volume of 20 m³ to 25 m³, in which the air is circulated by a low-speed fan. The oven is operated under cleaning conditions and the concentration of carbon monoxide is measured 1 m above the centre of the floor.

The concentration of carbon monoxide shall not exceed 0.015 %.

If the oven incorporates a heating element intended to eliminate smoke, the test is repeated with this heating element disconnected, unless the cleaning process can only be performed when the heating element is in circuit.

Unit: mm



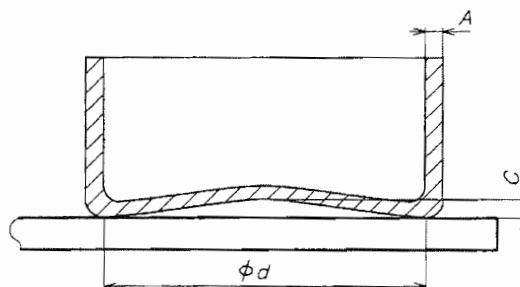
Unit: mm

| Diameter of cooking zone | Approximate dimension | | |
|--------------------------|-----------------------|-----|----|
| | a | b | c |
| ≤ 110 | 110 | 140 | 8 |
| $> 110 \leq 145$ | 145 | 140 | 8 |
| $> 145 \leq 180$ | 180 | 140 | 9 |
| $> 180 \leq 220$ | 220 | 120 | 10 |
| $> 220 \leq 300$ | 300 | 100 | 10 |

NOTE : The maximum concavity of the base of the vessel is to be not more than 0.05 mm.
The base of the vessel is not to be convex.

Figure 101 Vessel for testing hob elements

Unit: mm



A : Base and wall thickness, $2 \text{ mm} \pm 0.5 \text{ mm}$

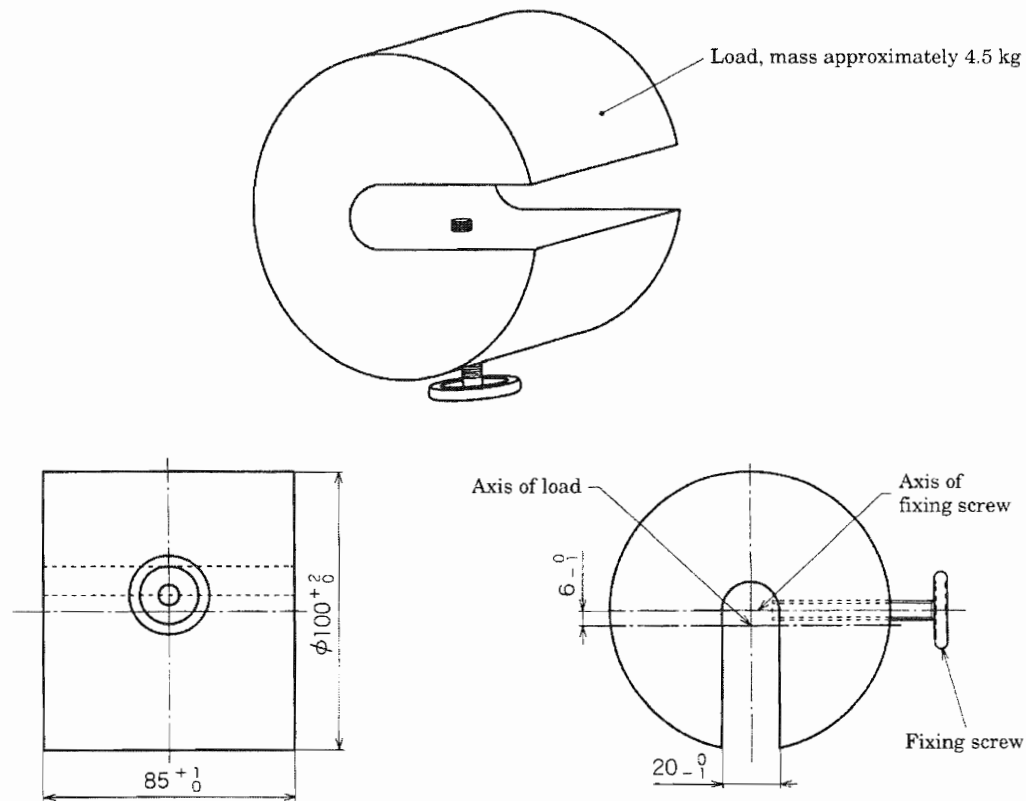
C : Maximum concavity

d : Diameter of the flat area of the base

NOTE : The vessel is made of low carbon steel having a maximum carbon content of 0.08 %. It is cylindrical without metallic handles or protrusions. The diameter of the flat area of the base of the vessel (denoted as "d") is to be at least the diameter of the cooking zone. The maximum concavity of the base of the vessel (denoted as "C") is $0.006 d$. The base of the vessel is not to be convex.

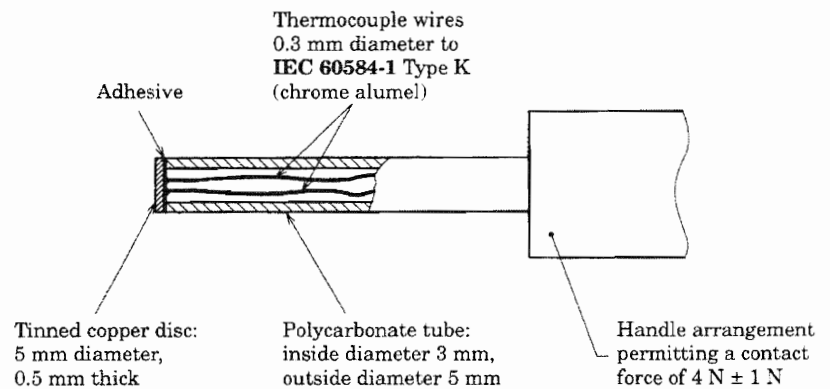
Figure 102 Vessel for testing induction hob elements

Unit: mm



NOTE : The load is positioned on the rotary spit so that the fixing screw contacts the diameter of the spit.

Figure 103 Load for testing rotating spits



NOTE : The contact face of the disc is to be flat. The thermocouple shall be soldered so that the temperature of disc is surely measured.

Figure 104 Probe for measuring surface temperatures

Annexes

The annexes of **JIS C 9335-1** are applicable.

Annex 1 (informative)

Comparison table between JIS and corresponding International Standard

| JIS C 9335-2-6:2004 <i>Household and similar electrical appliances—Safety—Part 2-6: Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances</i> | | | | IEC 60335-2-6:2002 <i>Household and similar electrical appliances—Safety—Part 2-6: Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances</i> | | | |
|---|--|------------------------------------|--|--|--|--|--|
| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted underlines | | (V) Justification for the technical deviation and future measures |
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 1 Scope | Safety of stationary electric cooking ranges, hobs, ovens and similar appliances for household use, their rated voltage being not more than 250 V for single-phase appliances, and 480 V for other appliances. | IEC 60335-2-6 | 1 | Identical with JIS. | IDT | — | |
| 2 Normative references | Additional normative reference for the text JIS C 1602. | IEC 60335-2-6 | 2 | Additional normative reference for the text IEC 60584-1 | MOD/alteration | Normative references in IEC which can be replaced by JIS are shown by JIS. | If there are citable JISs, all such IEC normative references are shown by JIS. |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted under-lines | | (V) Justification for the technical deviation and future measures |
|------------------------------------|--|------------------------------------|--|---|--|--|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 3 Definitions | Normal operation of each product, and definitions of products Flat control: Control actuated by moving of mechanical contact resulted from pushing by a finger. If the pushing pressure is not more than 4 N, such a control is considered to be a touch control. | IEC 60335-2-6 | 3 | Identical with JIS . However there is no definition of "flat control". | MOD/ addition | In JIS , switches which utilize a microswitch (with functional contact) are defined distinguished from "touch control". | These separate definitions are made based on such reason that the safety mechanism for "touch control" ("ON" state is established by operations of two different kinds) is not necessary, because there is "feeling of operation" when a switch with mechanical contact is turned to "ON". Proposal to IEC is under consideration. |
| 4 General requirement | Principle of safety. | IEC 60335-2-6 | 4 | Identical with JIS . | IDT | — | |
| 5 General conditions for the tests | Sample size, conditions for use of gas, etc. | IEC 60335-2-6 | 5 | Identical with JIS . | IDT | — | |
| 6 Classification | As regards classification according to protection against electric shock, at least class 0I is required. | IEC 60335-2-6 | 6 | As regards classification according to protection against electric shock, at least class I is required. | MOD/ addition | JIS admitted class 0I appliances. | Admission of class 0I appliances is based on circumstances of Japanese distribution system (no earth pole in socket-outlets). |
| 7 Marking and instructions | Marking of ratings, contents of instruction manual for each appliance. | IEC 60335-2-6 | 7 | Identical with JIS . | IDT | — | |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted underlines | | (V) Justification for the technical deviation and future measures |
|---|---|------------------------------------|--|-----------------------------|---|-------------------------------|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 8 Protection against access to live parts | Inspection by test finger and test probe. Live parts of ignition circuit. | IEC 60335-2-6 | 8 | Identical with JIS . | IDT | — | |
| 9 Starting of motor-operated appliances | Not applicable. | IEC 60335-2-6 | 9 | Identical with JIS . | IDT | — | |
| 10 Power input and current | For induction hob elements, the provisions for motor-operated appliances apply. | IEC 60335-2-6 | 10 | Identical with JIS . | IDT | — | |
| 11 Heating | Installation conditions, test duration, test voltages, points of temperature measurement, etc. are specified. | IEC 60335-2-6 | 11 | Identical with JIS . | IDT | — | |
| 12 Void | No specification. | IEC 60335-2-6 | 12 | Identical with JIS . | IDT | — | |
| 13 Leakage current and electric strength at operating temperature | Leakage current test and electric strength test under operating conditions. | IEC 60335-2-6 | 13 | Identical with JIS . | IDT | — | |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted underlines | | (V) Justification for the technical deviation and future measures |
|--|---|------------------------------------|--|---------------------|--|-------------------------------|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 14 Transient overvoltages | Alternation test by means of impulse for each clearance not satisfying the specified value. | IEC 60335-2-6 | 14 | Identical with JIS. | IDT | — | |
| 15 Moisture resistance | Water spillage test and moisture resistance test. | IEC 60335-2-6 | 15 | Identical with JIS. | IDT | — | |
| 16 Leakage current and electric strength | Evaluation of insulation after moisture resistance test. | IEC 60335-2-6 | 16 | Identical with JIS. | IDT | — | |
| 17 Overload protection of transformers and associated circuits | Temperature test in which overload or short circuit of transformer is simulated. | IEC 60335-2-6 | 17 | Identical with JIS. | IDT | — | |
| 18 Endurance | Not applicable. | IEC 60335-2-6 | 18 | Identical with JIS. | IDT | — | |
| 19 Abnormal operation | Operation without vessel, abnormal operation of induction hob element, etc. | IEC 60335-2-6 | 19 | Identical with JIS. | IDT | — | |
| 20 Stability and mechanical hazards | Stability of oven and range when the door is opened. | IEC 60335-2-6 | 20 | Identical with JIS. | IDT | — | |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted underlines | | (V) Justification for the technical deviation and future measures |
|-------------------------|---|------------------------------------|--|--|--|--|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 21 Mechanical strength | Strength test of glass and ceramic materials (surface of door and hob), thermal shock test of glass panel. | IEC 60335-2-6 | 21 | Identical with JIS. | IDT | — | |
| 22 Construction | Construction in general, fixing of hob elements, oven vents, interlocks of ovens, safety during cleaning, prevention of unintentional ON state of switches. 22.201 Appliance with flat controls shall have a supply switch, and the buzzer shall sound when the flat control switch is pushed or the heater becomes "ON". 22.202 Hobs or cooking ranges shall be so constructed that it is possible to confirm that the switch surely becomes "OFF" state, when the switch is operated from "ON" to "OFF", by means of light, colour, sound, etc. and that one or more of the following requirements are satisfied: | IEC 60335-2-6 | 22 | Identical with JIS. However, such construction of flat controls and mechanical switches that the power is not supplied unintentionally is not specified. | MOD/ addition | In JIS, no unintentional supply of power is specified also so mechanical switches (flat control switches and push turning switches). | Provisions are added because "flat control" is defined additionally and distinguished from "touch control". For other mechanical switches, prevention of unintentional operation of switches is necessary for fire prevention, due to housing situation and actual results of fire (especially by earthquake) in Japan. |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted under-lines | | (V) Justification for the technical deviation and future measures |
|--|--|------------------------------------|--|-----------------------------|--|-------------------------------|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 22 Construction (concluded) | <ul style="list-style-type: none"> — “ON” state shall not be realized without operation of locking mechanism (appliances which comply with 22.113 or 22.201 are excluded). — A guard shall be provided around the switch knob. — The operating part of switch knob shall be recessed from the surface of operating panel. | | | | | | |
| 23 Internal wiring | Flexural test of internal wiring and so on. | IEC 60335-2-6 | 23 | Identical with JIS . | IDT | — | |
| 24 Components | Switching test of switches and automatic controls. Socket-outlets in cooking ranges. | IEC 60335-2-6 | 24 | Identical with JIS . | IDT | — | |
| 25 Supply connection and external flexible cords | Kinds and sectional areas of supply cords and flexural test of temperature-sensing probes. | IEC 60335-2-6 | 25 | Identical with JIS . | IDT | — | |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted underlines | | (V) Justification for the technical deviation and future measures |
|--|--|------------------------------------|--|---------------------|--|-------------------------------|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 26 Terminals for external conductors | As specified in JIS C 9335-1. | IEC 60335-2-6 | 26 | Identical with JIS. | IDT | — | |
| 27 Provision for earthing | As specified in JIS C 9335-1. | IEC 60335-2-6 | 27 | Identical with JIS. | IDT | — | |
| 28 Screws and connections | As specified in JIS C 9335-1. | IEC 60335-2-6 | 28 | Identical with JIS. | IDT | — | |
| 29 Clearances, creepage distances and solid insulation | Clearances, creepage distances and thickness of solid insulation. Pollution degree 3 is applied. The thickness of solid insulation does not apply to the portion of visible glowing heat element inaccessible to the test probe. | IEC 60335-2-6 | 29 | Identical with JIS. | IDT | — | |
| 30 Resistance to heat and fire | Ball pressure test, glow-wire test and needle-flame test. | IEC 60335-2-6 | 30 | Identical with JIS. | IDT | — | |
| 31 Resistance to rusting | As specified in JIS C 9335-1. | IEC 60335-2-6 | 31 | Identical with JIS. | IDT | — | |

| (I) Requirements in JIS | | (II) International Standard number | (III) Requirements in International Standard | | (IV) Classification and details of technical deviation between JIS and the International Standard by clause Location of deviation: text Indication method: dotted underlines | | (V) Justification for the technical deviation and future measures |
|--|---|------------------------------------|--|-----------------------------|---|-------------------------------|---|
| Clause | Content | | Clause | Content | Classification by clause | Detail of technical deviation | |
| 32 Radiation, toxicity and similar hazards | Measurement of carbon monoxide exhausted from pyrolytic self-cleaning oven during its cleaning. | IEC 60335-2-6 | 32 | Identical with JIS . | IDT | — | |
| Annexes | As specified in JIS C 9335-1 . | IEC 60335-2-6 | Annexes | Identical with JIS . | IDT | — | |

Designated degree of correspondence between **JIS** and International Standard: MOD

Remarks 1 Symbols in sub-columns of classification by clause in the above table indicate as follows:

- IDT: Identical in technical contents.
- MOD/addition: Adds specification item(s) or content(s) not included in International Standard.
- MOD/alteration: Alters the specification content(s) included in International Standard.

2 Symbol in column of designated degree of correspondence between **JIS** and International Standard in the above table indicates as follows:

- MOD: Modifies International Standard.

Reference standards

The reference standards in **JIS C 9335-1** are applicable except as follows.

Addition:

- JIS C 9335-2-9 *Household and similar electrical appliances—Safety—Part 2-9 : Particular requirements for toasters, grills, roasters and similar appliances*
- JIS C 9335-2-25 *Household and similar electrical appliances—Safety—Part 2-25 : Particular requirements for microwave ovens including combination microwave ovens*

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

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